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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/770,893	02/03/2004	Shihong Gary Song	67097-022	1084

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BIRMINGHAM, MI 48009

EXAMINER
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KESSLER, CHRISTOPHER S

ART UNIT	PAPER NUMBER
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1793

MAIL DATE	DELIVERY MODE
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09/17/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/770,893	<b>Applicant(s)</b> SONG, SHIHONG GARY	
	<b>Examiner</b> CHRISTOPHER KESSLER	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 26-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 26-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7 November 2007 has been entered.

### ***Status of Claims***

2. Responsive to the amendment filed 7 November 2007, no amendments are made to the claims. Claims 1-16 and 26-29 are currently under examination.

### ***Status of Previous Rejections***

3. New grounds for rejection are presented in this Office action.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4, 10-13, 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watson.

Watson teaches an aluminum alloy with high strength and excellent thermal stability (column 4 line 31) comprising 10-70 vol %  $Al_3X L1_2$  formers including Er, Yb, Ti (column 3 lines 5-8, column 6 lines 11-15), and  $\geq 1$  wt% one or more of Mg, Ag, Zn, Li, and Cu (column 2 lines 35-54) which form solid solution matrix with aluminum. Watson teaches that a plurality of dispersion particles form from said added elements, namely  $Al_3X L1_2$  particles are formed (abstract, etc). Though Watson teaches a preferred embodiment of 3-16 wt% Sc, 3-6% Mg, 2-5% Zr, and 0.1-4% Ti (column 2 lines 10-11), Watson teaches that all of Ti, Zr, Sc are  $L1_2$  formers, as well as Er and Yb; and can be substituted for one another (column 3 lines 5-8). It would have been obvious to replace Sc with Er and Yb, because it is prima facie obvious to substitute equivalents known for the same purpose, see MPEP 2144.06. Therefore, the composition taught by Watson overlaps the presently claimed ranges of Yb and Er, as well as 1 + minor element selected from Ti, Mg, Ag, Zn, and Cu (cl. 1-4, 10-13, 26-29).

Regarding claims 10-13, Watson further teaches the alloy can be used for gas turbine engines where low weight is required and temperatures are on the order of 300°C (column 5 lines 46-50).

The ranges taught by Watson overlap the instantly claimed ranges, establishing a prima facie case of obviousness for those ranges. It would have been obvious to one of ordinary skill in the art at time of invention to have selected a composition within the ranges as claimed, because Watson teaches the same utility over overlapping ranges.

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Applicant is further directed to MPEP § 2144.05. Additionally, "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages," *In re Peterson*, 65 USPQ2d at 1379 (CAFC 2003).

6. Claims 1-5, 7, 8, 10-16, and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higashi.

Higashi teaches an aluminum alloy with excellent properties comprising 0.5-10% total one or more RE elements including Gd, Er, Yb, and Y (column 2 lines 31-32, 51 ) in order to improve the resistance to stress and corrosion and improve workability of said aluminum alloy (column 2 lines 38-40, 54-57), which is a close approximation of "greater than 10% weight" total of 1<sup>st</sup> and 2<sup>nd</sup> RE elements in instant claims 1, 4, 5, 7, 8, 10, 13-16. Said alloy also contains Zn, Mg, Mn, Cu in ranges that fall within the claimed "at least one minor element" ranges of instant claims 2, 3, 11, 12, 28, 29 (see Table 4, Higashi at cl. 1 and 2).

Though Higashi does not specify that particles/precipitates are formed from said RE additives, Higashi does teach precipitation age hardening in said examples.

Because the composition taught by Higashi is a close approximation of the presently claimed composition, and because Higashi teaches precipitation age hardening step, then substantially the same precipitates are expected to form as in the instant case.

Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05. A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have

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expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

Concerning claims 10-16, though Higashi does not mention using said alloy for gas turbine engine components, it would have been obvious to one of ordinary skill in the art to form the alloy taught by Higashi into gas turbine engine component, because Higashi teaches the Al-RE alloy has excellent mechanical properties, and improved resistance to stress and corrosion (column 2 line 40).

7. Claims 1-3, 7-12, 15, 16, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '911.

EP'911 teaches an aluminum alloy composition with  $Al_aFe_bRE_cMn_d$ , wherein  $a = 85-95$  at%,  $b = 2-8$  at%,  $c = 1-6$  at%,  $d = 0.5-6$  at%, and RE includes at least one element selected from a markush group including Y and Gd (page 3 lines 12-15), which overlaps the composition in claims 1-3, 7-12, 15, 16, 26. The composition of claim 9 of: 13-16 wt% Gd and approx. 4 wt% Y, converts to: 2.6-3.3 at% Gd and approx. 1.4 at% Y, balance aluminum, which falls within the alloy taught by EP'911. EP'911 further teaches intermetallic compounds are formed with RE elements, thereby resulting in increased hardness, strength, and toughness (column 2 line 25-26). Though EP'911 does not specify the addition of at least one minor element such as Mg (or Cu, Zn, Ag, Mg, Sn, Ti, Co, Ca) in claims 1, 3, 10, 12, 27, the instant claims do not recite a minimum amount of said element(s), and therefore inevitable impurity amounts of said element(s), inherently expected in the prior art, are held to meet said claim limitation.

Because EP'911 teaches an overlapping alloy composition, it is held that EP'911 has created a prima facie case of obviousness of the presently claimed invention. Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05.

Concerning claims 10, 12, 15, 16, though EP'911 does not mention using said alloy for gas turbine engine components, it would have been obvious to one of ordinary skill in the art to form the alloy taught by EP'911 into gas turbine engine component, because EP'911 teaches the A1-RE alloy has excellent mechanical properties, such as increased hardness, strength, and toughness (column 2 line 25-26).

8. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watson in view of Higashi.

Regarding claim 5, The teachings of Watson are detailed above. Watson does not teach wherein the alloy comprises the rare earth element yttrium.

Higashi teaches an aluminum alloy with excellent properties comprising 0.5-10% total one or more RE elements including Gd, Er, Yb, and Y (column 2 lines 31-32, 51 ) in order to improve the resistance to stress and corrosion and improve workability of said aluminum alloy (column 2 lines 38-40, 54-57). Higashi further teaches that the preferred elements are Y, La, Ce, Pr Nd or Sm, and that the preferred amount of said elements is 4.0-6.0% (see col. 2), said range overlapping the instantly claimed range and establishing a prima facie case of obviousness. It would have been obvious to one of ordinary skill in the art at time of invention to have selected an amount of yttrium

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within the ranges as claimed, because Higashi teaches the same utility over an overlapping range. Applicant is further directed to MPEP § 2144.05.

It would have been obvious to one of ordinary skill in the art at time of invention to have altered the alloy of Watson by adding Yttrium, as taught by Higashi, in order to provide a high resistance to stress and corrosion, as taught by Higashi (see col. 2).

Regarding claim 6, Watson teaches that the composition includes 10-70 vol%  $Al_3X$  phase, and that said phase is formed from one or more of Sc, Er, Lu, Yb, Tm and U (see cl. 1). Thus, the range of Yb in Watson overlaps the instantly claimed range, establishing a prima facie case of obviousness for that range. It would have been obvious to one of ordinary skill in the art at time of invention to have selected a composition within the ranges as claimed, because Watson teaches the same utility over overlapping ranges. Applicant is further directed to MPEP § 2144.05. Further, it would have been obvious to one of ordinary skill in the art to have substituted Yb for Sc in the preferred composition of Watson, because Watson teaches that these two elements are each  $L_{12}$  formers (see col. 3 and claim 1). Applicant is further directed to MPEP 2144.06.

***Response to Declaration under 37 C.F.R. 1.131***

9. A request for continued examination under 37 CFR 1.114 was filed in this application after appeal to the Board of Patent Appeals and Interferences, but prior to a decision on the appeal. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the



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appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 7 November 2007 has been entered.

The declaration filed on 7 November 2007 under 37 CFR 1.131 is sufficient to overcome the Olson reference. New grounds of rejection are presented.

### ***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER KESSLER whose telephone number is (571)272-6510. The examiner can normally be reached on Mon-Fri, 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Roy King/  
Supervisory Patent Examiner, Art  
Unit 1793

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<b><i>Application Number</i></b> 	<b>Application/Control No.</b>	<b>Applicant(s)/Patent under Reexamination</b>	
	10/770,893	SONG, SHIHONG GARY	
	<b>Examiner</b>	<b>Art Unit</b>	
	CHRISTOPHER KESSLER	1793	